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speak, by the phagocytes. The phagocytes can be seen with whole plasmodia in them, or with fragments, or with only the granules or little black pieces of red blood corpuscles, to which reference has been made.

Quinine is especially deadly to the development and life of the plasmodia. Thus we can account rationally and theoretically for its beneficial effects in the treatment of malarial diseases. The use of the drug—for which we are indebted to the instinct, perhaps, of the Peruvian Indian, or at least to pure empiricism—is placed upon a true scientific basis.

Without doubt, the malarial plasmodium is developed outside of the body in decaying organic matter, particularly in swampy districts. Nevertheless, this has not been proven, for it has never been seen or cultivated like other disease germs outside of the body. Many scientists believe it to be a water germ, and to be principally transferred to man through the medium of drinking water. Some have advanced the theory that mosquitoes carry it and inoculate man when they insert their probosces in the flesh! The facts, however, I think, bear out the conclusion that it may be taken in with the air breathed, that it is air-born and from the earth where it finds its origin.

We might sum up our knowledge of malaria about as follows:

1st. Malaria is caused by a germ or parasite.

2d. These parasites destroy the red blood corpuscles.

3d. They complete in the blood a cycle of existence which corresponds to the stages of the disease.

4th. The plasmodia not only attack the red blood corpuscles but also effect certain changes in other tissues of the body, particularly the spleen, kidneys and bone marrow.

In addition to these conclusions it seems probable that different kinds of malarial diseases are caused by different varieties of plasmodia.

CYRUS EDSON.

THE FUNCTION OF PUBLIC EDUCATION.

THE large and growing interest in the subject of public education finds voice, not only in private discussion, but in the number of articles that are constantly being written upon the subject. In following the latter, one cannot help noticing how diverse, and often confusing, are the ideas advanced. The writers start from differing premises, but generally come to some vague conclusions about the necessity of more and better educational facilities. In all this, the distinction between education in general, and state education in particular, appears to be lost sight of completely. School boards are criticised and belabored, the most elaborate and expensive systems are strenuously advised, and it is assumed that it is the business of the state to furnish all the higher education that the rising generation may find useful. Much confusion would be avoided, and the discussions less at cross-purposes, if writers would clearly define what they mean by public education. Why does the state educate? and how far should it educate? If any substantial unanimity upon these questions could be arrived at, the whole problem would be simplified, and the direction of advance be clear and assured.

Before attempting to answer the above query, it may be well to bring out the negative side of the question. The state does not educate for charity.

The most ardent advocates of higher education by the state do not put the ground of their request upon charity. Neither does the state undertake education to give culture or polish to a number of its citizens; if so, it becomes a form of socialism, and, to be consistent, other good things should likewise be furnished. Where shall we draw the line? It would be much better for the state to furnish hygienic houses and apartments to the people at a moderate rental, than to offer the advantages of a higher education. The former is actually done by most of the large cities of Great Britain. In any scheme of advancing socialism, higher education should be the last thing attempted. As at present constituted, the state does not educate with socialistic ideas and motives. Why, then, *does* the state educate? To preserve itself. How far should the state educate? Simply to the point necessary for its preservation. *The underlying principle of state education is state preservation.* The moment we leave the principle of necessity, we are on uncertain and debatable ground. It does not require much discussion to determine the simple and fundamental branches of education that the state should teach in order to protect itself against gross ignorance and inefficiency. Reading, writing, figuring, and a knowledge of the country's history should be most thoroughly taught. To this could be combined an education of the hand as well as of the head, the first rudiments of training having been started in the kindergarten. All appliances for teaching these fundamentals of education should be most modern and complete, and carried on under the best hygienic surroundings. The absence of any attempt to cope with the higher and more ornamental branches would leave sufficient time and money to lay a proper ground-work in every child's case, even the most backward and unpromising one. The importance of primary education is now universally recognized, as it is, directly or indirectly, made compulsory in all civilized countries. When, however, the state attempts to carry education along higher lines, the temptation to neglect the humble primary branches in the interest of the upper and more showy grades, becomes apparently impossible to resist. This tendency is nowhere more glaringly exhibited than in New York, where public education is poor and incomplete in the primary and fundamental parts, but elaborate in the higher and non-essential grades. We have two well-equipped colleges with many courses, and numerous grammar schools on the one hand; on the other, primary schools without proper appliances for either health or education, overcrowded and unable to accommodate many of the children who apply for even this poor modicum of instruction. The great majority of the children of New York who are educated at the city's expense never get beyond the primary grades, as they have to begin to earn their living at from twelve to fourteen years of age. A conservative estimate places the number of children who cannot be accommodated for want of room at the public schools, at fifty thousand, the great majority of whom are candidates for the primary grades. Poor as it is, the fundamentals of education are thus denied to a large number of children who need such training. Many of these children are of foreign parentage, and are thus in danger of growing up in ignorance of our laws and institutions, unless the state educates them, as a measure for its own protection.

The last census shows that illiteracy is twice as great among the foreign born population than among the natives, excluding the colored population of the South. When the question is looked at from the standpoint of state preservation, as well as from justice and right, the folly of this disproportion-

tion of expenditure upon upper grades of schooling in proportion to the number of children benefited, becomes apparent. At bottom, it is a financial question as to where money that has been given for a certain purpose can be, and should be, best spent. We are not here discussing the desirability of universal higher education although much can be said on either side of this question. Greece, with a population of barely two million, and seven gymnasia or colleges, with one university, might be looked at from all sides in studying such a problem. Experience has shown that the state can devote about so much money to the various functions it has to perform. Public education can claim no exemption from this rule. When more is attempted than is justifiable by the resources at hand, either some part of the course must suffer, or enormous demands be made at the hands of the taxpayers. The New York Board of Education recently submitted to the Board of Estimate and Apportionment the sum of \$5,648,079 as the lowest sum that is needed to conduct the expenses of our public schools during the coming year. Last summer the Board of Education took steps toward the erection of seven new school houses, but when these are completed, many more will still be necessary to accommodate the large number of little children for whom no provision is made. Many of the older buildings are in a deplorable hygienic condition.

At a public meeting last winter, Commissioner Wehrum, who had made an inspection and study of the subject, declared that seven million dollars would be required to put the public schools of New York into proper sanitary condition. The writer, who has made a careful sanitary inspection of many of the school-houses, believes this to be a conservative estimate. The new school-houses are rendered expensive to construct from the wide range of instruction that is required in them. Outside the great expense of properly housing the children, the cost of instruction averages \$31 per head, with from 175,000 to 180,000 enrolled. If all these children could take advantage of the whole course, it might be a question whether this large expense were not justified. Only a small proportion, however, advance to the upper grades, which form the costly part of the system, while for half that sum per head, thorough primary education could be furnished to all. Complete elementary instruction of the best quality, freely guaranteed to every child, is all that the city or state should be required to furnish. When it attempts to go beyond this, it involves enormous expense to give advantages to the few who can benefit by them, and the beginners are usually the first to suffer from this draining of the funds in wrong directions. New York forms an object lesson of the evils here portrayed, with its badly appointed, overcrowded primary schools that cannot accommodate the throngs of children seeking admission, in spite of the enormous sums that are devoted to public education.

In the newer communities of the West, the expenses of public instruction are largely borne by the returns from land grants, and accordingly the ornamental and higher grades of education receive much attention. But these communities usually have more crying needs in other directions for the expenditure of public moneys. Last summer, the writer visited a Western city of about seventy thousand inhabitants, that had expended three hundred thousand dollars in the construction of a public high school, where everything was taught, from music to zoölogy. The rooms and appliances were modern and almost palatial, but the superintendent told me that only about five per cent. of the public school children could afford the time to

take the course. The town drains into a lake, and takes its water supply from the same source, the two pipes being not far separate. As a result, infectious diseases are common, especially typhoid fever. This town can afford to give a few of its children ornamental education at public expense, but it cannot find funds for proper drainage and water supply.

One of the first functions of the state, more important even than education, should be to ensure healthful living conditions for the people. At any rate, if any funds are left after primary education has been attained, they can be best employed in stamping out preventable diseases, such as diphtheria and typhoid fever. The whole question will be simplified if the proposition be accepted as a sound one, that the state should educate only to the point necessary to preserve itself. This point can be reached by thorough and universal primary education. No aid is afforded this problem by attempting to give a few the advantages of a higher education. According to the census of 1860, 72 per cent. of the population of Spain could neither read nor write, but it boasted in the possession of ten universities!

HENRY DWIGHT CHAPIN,

AN EXPENSIVE DELUSION.

DURING the war of extermination against the Unitarians of southern Spain, a number of Moorish mothers flung their children into the sea, rather than surrender them into the hands of their persecutors. It may be doubted if since that time the history of the civilized world has recorded a more portentous expedient of protest than the result of the recent elections, when sixty-eight thousand of our fellow-citizens took refuge in a political tiger-den, to effect their deliverance from the yoke of Sabbatarian despotism.

"*Del Rey y de la Inquisicion calla la boca*" was a Spanish proverb—"Seal your lips to criticisms of the King and the Inquisition"; but the extremes of intolerance provoked an outburst of public indignation which finally led to their abatement, and it is a significant fact that almost for the first time a representative of the American press has ventured to name the delusion which for many long years has darkened our social atmosphere like an all-pervading mist, robbing the sky of its sunlight and the woods and fields of their birdsong. "But for the exasperating effect of uncalled-for, unjust, harsh, and oppressive execution of the Sunday laws," says a leading metropolitan newspaper, "a union of all the anti-Tammany forces would have been as easy and triumphant as it was last year."

The charge of obstinate folly, it is true, has been retorted upon the leaders of the opposition. They have been accused of reckless selfishness; of a "blind antagonism to the moral sentiment of their neighbors," just as the apologists of the Inquisition attributed the fate of those Moorish children to the headstrong fanaticism of their parents, though the alleged fanatics would have been glad to purchase partial recognition of their human rights by connivance at the most extravagant sectarian practices of their persecutors.

The advocates of personal liberty have no quarrel with religion, nor with personal bigotry in its most pronounced Sabbatarian forms, but only with *aggressive asceticism*, with the belief in the possibility of bettering the world by the suppression of popular pastimes, and the duty of continuing the attempt in spite of invariable disappointments. That belief—the key-